

SEQUENCE LISTING

(1) GENERAL INFORMATION:

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DONJON DE SAINT-MARTIN, JACQUELINE
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(ii) TITLE OF THE INVENTION: NUCLEOTIDE SEQUENCES OF HIV-1 TYPE (OR SUBTYPE)
ANTIGENS

(iii) NUMBER OF SEQUENCES: 103

(iv) CORRESPONDENCE ADDRESS:

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(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30

(vi) CURRENT APPLICATION DATA:

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(ix) TELECOMMUNICATION INFORMATION:

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(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid

- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: Other nucleic acid
 - (A) DESCRIPTION: /desc = "oligonucleotide"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

AGTGGATWYA TAGAAGCAGA AGT

23

- (2) INFORMATION FOR SEQ ID NO: 2:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: Other nucleic acid
 - (A) DESCRIPTION: /desc = "oligonucleotide"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

ACTGCYCCTT CHCCTTTCCA

20

- (2) INFORMATION FOR SEQ ID NO: 3:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 28 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: Other nucleic acid
 - (A) DESCRIPTION: /desc = "oligonucleotide"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

GCTCTAGATG GGGATCTCCC ATGGCAGG

28

- (2) INFORMATION FOR SEQ ID NO: 4:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 30 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: Other nucleic acid
 - (A) DESCRIPTION: /desc = "oligonucleotide"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

GCTCTAGATC AGGGAAGAAT CCCTGAGTGT

30

- (2) INFORMATION FOR SEQ ID NO: 5:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 7 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

Cys Lys Asn Arg Leu Ile Cys
 1 5

(2) INFORMATION FOR SEQ ID NO: 6:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

Arg Leu Leu Ala Leu Glu Thr Phe Ile Gln Asn Trp Trp Leu Leu Asn
 1 5 10 15
 Leu Trp Gly Cys Lys Asn Arg Leu Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 7:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 37 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Arg Ala Arg Leu Leu Ala Leu Glu Thr Phe Ile Gln Asn Gln Gln Leu
 1 5 10 15
 Leu Asn Leu Trp Gly Cys Lys Asn Arg Leu Ile Cys Tyr Thr Ser Val
 20 25 30
 Lys Trp Asn Lys Thr
 35

(2) INFORMATION FOR SEQ ID NO: 8:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

Ala His Pro Gln Gln Ala
1 5

(2) INFORMATION FOR SEQ ID NO: 9:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

Leu Trp Thr Thr Arg Ala Gly Asn Pro
1 5

(2) INFORMATION FOR SEQ ID NO: 10:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Ala Val Glu Glu Lys Ala
1 5 10 15
Phe Asn Pro Glu Ile Ile Pro Met Phe Met Ala Leu Ser Glu Gly Ala
20 25 30

(2) INFORMATION FOR SEQ ID NO: 11:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 amino acids

- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

Met Leu Asn Ala Ile Gly Gly His Gln Gly Ala Leu Gln Val Leu Lys
 1 5 10 15
 Glu Val Ile Asn
 20

(2) INFORMATION FOR SEQ ID NO: 12:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 27 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

Gly Pro Leu Pro Pro Gly Gln Ile Arg Glu Pro Thr Gly Ser Asp Ile
 1 5 10 15
 Ala Gly Thr Thr Ser Thr Gln Gln Glu Gln Ile
 20 25

(2) INFORMATION FOR SEQ ID NO: 13:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 30 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

Ile Pro Val Gly Asp Ile Tyr Arg Lys Trp Ile Val Leu Gly Leu Asn
 1 5 10 15
 Lys Met Val Lys Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
 20 25 30

(2) INFORMATION FOR SEQ ID NO: 14:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 21 amino acids
 - (B) TYPE: amino acid

- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
1 5 10 15
Thr Lys Leu Ala Glu
 20

(2) INFORMATION FOR SEQ ID NO: 15:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 10 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
1 5 10

(2) INFORMATION FOR SEQ ID NO: 16:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 10 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr
1 5 10

(2) INFORMATION FOR SEQ ID NO: 17:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 14 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
1 5 10

(2) INFORMATION FOR SEQ ID NO: 18:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 4 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

Asn Pro Glu Ile
1

(2) INFORMATION FOR SEQ ID NO: 19:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19:

Ala Val Glu Glu Lys Ala Phe Asn Pro Glu Ile Ile Pro Met Phe Met
1 5 10 15

(2) INFORMATION FOR SEQ ID NO: 20:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

Ile Gly Gly His Gln Gly Ala Leu Gln
1 5

(2) INFORMATION FOR SEQ ID NO: 21:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 21:

Arg Glu Pro Thr Gly Ser Asp Ile
1 5

(2) INFORMATION FOR SEQ ID NO: 22:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

Ile Asn Asp Glu Ala Ala Asp Trp Asp
1 5

(2) INFORMATION FOR SEQ ID NO: 23:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 5 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

Lys Glu Ile Lys Ile
1 5

(2) INFORMATION FOR SEQ ID NO: 24:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

Glu Arg Glu Gly Lys Gly Ala Asn
1 5

(2) INFORMATION FOR SEQ ID NO: 25:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 14 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:

Cys Val Arg Pro Gly Asn Asn Ser Val Lys Glu Ile Lys Ile
1 5 10

(2) INFORMATION FOR SEQ ID NO: 26:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 12 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:

Gln Ile Glu Arg Glu Gly Lys Gly Ala Asn Ser Arg
1 5 10

(2) INFORMATION FOR SEQ ID NO: 27:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27:

Cys Val Arg Pro Gly Asn Asn Ser Val Lys Glu Ile Lys Ile Gly Pro
1 5 10 15
Met Ala Trp Tyr Ser Met Gln Ile Glu Arg Glu Gly Lys Gly Ala Asn
20 25 30

Ser Arg Thr Ala Phe Cys
35

(2) INFORMATION FOR SEQ ID NO: 28:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:

Gly Pro Met Ala Trp Tyr Ser Met
1 5

(2) INFORMATION FOR SEQ ID NO: 29:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 14 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

Arg Leu Leu Ala Leu Glu Thr Leu Met Gln Asn Gln Gln Leu
1 5 10

(2) INFORMATION FOR SEQ ID NO: 30:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

Leu Asn Leu Trp Gly Cys Arg Gly Lys Ala Ile Cys Tyr Thr Ser Val
1 5 10 15
Gln Trp Asn Glu Thr Trp Gly
20

(2) INFORMATION FOR SEQ ID NO: 31:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids

- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 31:

Cys Arg Gly Lys Ala Ile
1 5

(2) INFORMATION FOR SEQ ID NO: 32:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 5 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 32:

Ser Val Gln Trp Asn
1 5

(2) INFORMATION FOR SEQ ID NO: 33:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 28 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 33:

Arg Leu Leu Ala Leu Glu Thr Leu Met Asn Gln Gln Leu Leu Asn Leu
1 5 10 15
Trp Gly Cys Arg Gly Lys Ala Ile Cys Tyr Thr Ser
20 25

(2) INFORMATION FOR SEQ ID NO: 34:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 24 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 34:

Gln Asn Gln Gln Leu Leu Asn Leu Trp Gly Cys Arg Gly Lys Ala Ile
1 5 10 15

Cys Tyr Thr Ser Val Gln Trp Asn
20

(2) INFORMATION FOR SEQ ID NO: 35:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 35:

Arg Ile Leu Ala Val Glu Arg Tyr
1 5

(2) INFORMATION FOR SEQ ID NO: 36:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 36:

Ser Gly Lys Leu Ile Cys
1 5

(2) INFORMATION FOR SEQ ID NO: 37:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 37:

Gly Pro Gly Arg Ala Phe
1 5

(2) INFORMATION FOR SEQ ID NO: 38:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 38:

Gly Pro Met Ala Trp Tyr
1 5

(2) INFORMATION FOR SEQ ID NO: 39:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 39:

Gly Pro Met Arg Trp Arg
1 5

(2) INFORMATION FOR SEQ ID NO: 40:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 5 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 40:

Thr Phe Ile Gln Asn
1 5

(2) INFORMATION FOR SEQ ID NO: 41:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 41:

Trp Gly Cys Lys Asn Arg
1 5

(2) INFORMATION FOR SEQ ID NO: 42:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 24 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Other nucleic acid
(A) DESCRIPTION: /desc = "oligonucleotide"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 42:

ATTCCAATAC ACTATTGTGC TCCA

24

(2) INFORMATION FOR SEQ ID NO: 43:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 24 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Other nucleic acid
(A) DESCRIPTION: /desc = "oligonucleotide"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 43:

AAAGAATTCT CCATGACTGT TAAA

24

(2) INFORMATION FOR SEQ ID NO: 44:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 24 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Other nucleic acid
(A) DESCRIPTION: /desc = "oligonucleotide"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 44:

GGTATAGTGC AACAGCAGGA CAAC

24

(2) INFORMATION FOR SEQ ID NO: 45:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "oligonucleotide"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 45:

AGAGGCCCAT TCATCTAACT C

21

(2) INFORMATION FOR SEQ ID NO: 46:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 526 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 46:

Met Thr Ala Ile Met Lys Ala Met Gly Lys Arg Asn Arg Lys Leu Gly
1 5 10 15
Ile Trp Cys Leu Ile Leu Ala Leu Ile Ile Pro Cys Leu Ser Cys Asn
20 25 30
Gln Leu Tyr Ala Thr Val Tyr Ser Gly Val Pro Val Trp Glu Asp Ala
35 40 45
Lys Pro Thr Leu Phe Cys Ala Ser Asp Ala Asn Leu Thr Ser Thr Glu
50 55 60
Gln His Asn Ile Trp Ala Thr Gln Ala Cys Val Pro Thr Asp Pro Ser
65 70 75 80
Pro Asn Glu Tyr Glu Leu Lys Asn Val Thr Gly Lys Phe Asn Ile Trp
85 90 95
Lys Asn Tyr Ile Val Asp Gln Met His Glu Asp Ile Ile Asp Leu Trp
100 105 110
Asp Gln Ser Leu Lys Pro Cys Val Gln Met Thr Phe Leu Cys Val Gln
115 120 125
Met Asn Cys Thr Asp Ile Lys Asn Ser Ile Asn Thr Thr Asn Ser Pro
130 135 140
Leu Asn Ser Asn Asn Thr Lys Glu Val Lys Gln Cys Asp Phe Asn Val
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485 490 495
 Tyr Lys Val Val Arg Val Lys Pro Phe Ser Val Ala Pro Thr Lys Ile
 500 505 510
 Ala Arg Pro Thr Ile Gly Thr Arg Ser His Arg Glu Lys Arg
 515 520 525

(2) INFORMATION FOR SEQ ID NO: 47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 351 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 47:

Ala Ala Gly Leu Ala Met Leu Phe Leu Gly Ile Leu Ser Ala Ala Gly
 1 5 10 15
 Ser Thr Met Gly Ala Ala Ala Thr Ala Leu Thr Val Arg Thr Gln His
 20 25 30
 Leu Ile Lys Gly Ile Val Gln Gln Gln Asp Asn Leu Leu Arg Ala Ile
 35 40 45
 Gln Ala Gln Gln His Leu Leu Arg Pro Ser Val Trp Gly Ile Arg Gln
 50 55 60
 Leu Arg Ala Arg Leu Leu Ala Leu Glu Thr Phe Ile Gln Asn Gln Gln
 65 70 75 80
 Leu Leu Asn Leu Trp Gly Cys Lys Asn Arg Leu Ile Cys Tyr Thr Ser
 85 90 95
 Val Lys Trp Asn Lys Thr Trp Gly Gly Asp Asn Glu Ser Ile Trp Asp
 100 105 110
 Glu Leu Thr Trp Gln Gln Trp Asp Gln Gln Ile Asn Asn Val Ser Ser
 115 120 125
 Phe Ile Tyr Glu Lys Ile Gln Glu Ala Gln Glu Gln Gln Glu Lys Asn
 130 135 140
 Glu Lys Glu Leu Leu Glu Leu Asp Glu Trp Ala Ser Ile Trp Asn Trp
 145 150 155 160
 Leu Asp Ile Thr Lys Trp Leu Trp Tyr Ile Lys Ile Ala Ile Ile Ile
 165 170 175
 Val Gly Ala Leu Ile Gly Val Arg Val Val Met Ile Val Leu Asn Leu
 180 185 190
 Val Lys Asn Ile Arg Gln Gly Tyr Gln Pro Leu Ser Leu Gln Ile Pro
 195 200 205
 Ile Gln Gln Gln Ala Glu Val Gly Thr Pro Gly Gly Thr Gly Glu Gly
 210 215 220

Gly Gly Asp Glu Asp Arg Arg Arg Trp Thr Pro Leu Pro Gln Gly Phe
 225 230 235 240
 Leu His Leu Leu Tyr Thr Asp Leu Arg Thr Ile Ile Leu Trp Ile Tyr
 245 250 255
 His Leu Leu Ser Asn Leu Ala Ser Glu Ile Gln Lys Leu Ile Arg His
 260 265 270
 Leu Gly Leu Gly Leu Trp Ile Ile Gly Gln Arg Thr Ile Glu Ala Cys
 275 280 285
 Arg Leu Phe Lys Ala Ile Ile Gln Tyr Trp Leu Gln Glu Leu Gln Thr
 290 295 300
 Ser Ala Thr Asn Leu Leu Asp Thr Val Ala Val Ala Val Ala Asn Trp
 305 310 315 320
 Thr Asp Ser Thr Ile Leu Gly Ile Gln Ser Ile Gly Arg Gly Ile Leu
 325 330 335
 Asn Ile Pro Arg Arg Ile Arg Gln Gly Leu Glu Arg Leu Leu Leu
 340 345 350

(2) INFORMATION FOR SEQ ID NO: 48:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 516 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 48:

Met Arg Val Lys Glu Lys Tyr Gln His Leu Trp Arg Trp Gly Trp Lys
 1 5 10 15
 Trp Gly Thr Met Leu Leu Gly Ile Leu Met Ile Cys Ser Ala Thr Glu
 20 25 30
 Lys Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys Glu Ala
 35 40 45
 Thr Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp Thr Glu
 50 55 60
 Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp Pro Asn
 65 70 75 80
 Pro Gln Glu Val Val Leu Val Asn Val Thr Glu Asn Phe Asn Met Trp
 85 90 95
 Lys Asn Asp Met Val Glu Gln Met His Glu Asp Ile Ile Ser Leu Trp
 100 105 110
 Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys Val Ser
 115 120 125

Leu Lys Cys Thr Asp Leu Gly Asn Ala Thr Asn Thr Asn Ser Ser Asn
 130 135 140
 Thr Asn Ser Ser Ser Gly Glu Met Met Met Glu Lys Gly Glu Ile Lys
 145 150 155 160
 Asn Cys Ser Phe Asn Ile Ser Thr Ser Ile Arg Gly Lys Val Gln Lys
 165 170 175
 Glu Tyr Ala Phe Phe Tyr Lys Leu Asp Ile Ile Pro Ile Asp Asn Asp
 180 185 190
 Thr Thr Ser Tyr Thr Leu Thr Ser Cys Asn Thr Ser Val Ile Thr Gln
 195 200 205
 Ala Cys Pro Lys Val Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala
 210 215 220
 Pro Ala Gly Phe Ala Ile Leu Lys Cys Asn Asn Lys Thr Phe Asn Gly
 225 230 235 240
 Thr Gly Pro Cys Thr Asn Val Ser Thr Val Gln Cys Thr His Gly Ile
 245 250 255
 Arg Pro Val Val Ser Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu
 260 265 270
 Glu Glu Val Val Ile Arg Ser Ala Asn Phe Thr Asp Asn Ala Lys Thr
 275 280 285
 Ile Ile Val Gln Leu Asn Gln Ser Val Glu Ile Asn Cys Thr Arg Pro
 290 295 300
 Asn Asn Asn Thr Arg Lys Ser Ile Arg Ile Gln Arg Gly Pro Gly Arg
 305 310 315 320
 Ala Phe Val Thr Ile Gly Lys Ile Gly Asn Met Arg Gln Ala His Cys
 325 330 335
 Asn Ile Ser Arg Ala Lys Trp Asn Ala Thr Leu Lys Gln Ile Ala Ser
 340 345 350
 Lys Leu Arg Glu Gln Phe Gly Asn Asn Lys Thr Ile Ile Phe Lys Gln
 355 360 365
 Ser Ser Gly Gly Asp Pro Glu Ile Val Thr His Ser Phe Asn Cys Gly
 370 375 380
 Gly Glu Phe Phe Tyr Cys Asn Ser Thr Gln Leu Phe Asn Ser Thr Trp
 385 390 395 400
 Phe Asn Ser Thr Trp Ser Thr Glu Gly Ser Asn Asn Thr Glu Gly Ser
 405 410 415
 Asp Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln Phe Ile Asn Met Trp
 420 425 430
 Gln Glu Val Gly Lys Ala Met Tyr Ala Pro Pro Ile Ser Gly Gln Ile
 435 440 445
 Arg Cys Ser Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg Asp Gly Gly
 450 455 460
 Asn Asn Asn Asn Gly Ser Glu Ile Phe Arg Pro Gly Gly Gly Asp Met
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465 470 475 480
 Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys Val Val Lys Ile
 485 490 495
 Glu Pro Leu Gly Val Ala Pro Thr Lys Ala Lys Arg Arg Val Val Gln
 500 505 510
 Arg Glu Lys Arg
 515

(2) INFORMATION FOR SEQ ID NO: 49:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 345 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 49:

Ala Val Gly Ile Gly Ala Leu Phe Leu Gly Phe Leu Gly Ala Ala Gly
 1 5 10 15
 Ser Thr Met Gly Ala Arg Ser Met Thr Leu Thr Val Gln Ala Arg Gln
 20 25 30
 Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile
 35 40 45
 Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln
 50 55 60
 Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln
 65 70 75 80
 Leu Leu Gly Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys Thr Thr Ala
 85 90 95
 Val Pro Trp Asn Ala Ser Trp Ser Asn Lys Ser Leu Glu Gln Ile Trp
 100 105 110
 Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr
 115 120 125
 Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys
 130 135 140
 Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn
 145 150 155 160
 Trp Phe Asn Ile Thr Asn Trp Leu Trp Tyr Ile Lys Ile Phe Ile Met
 165 170 175
 Ile Val Gly Gly Leu Val Gly Leu Arg Ile Val Phe Ala Val Leu Ser
 180 185 190
 Ile Val Asn Arg Val Arg Gln Gly Tyr Ser Pro Leu Ser Phe Gln Thr
 195 200 205

His Leu Pro Thr Pro Arg Gly Pro Asp Arg Pro Glu Gly Ile Glu Glu
 210 215 220
 Glu Gly Gly Glu Arg Asp Arg Asp Arg Ser Ile Arg Leu Val Asn Gly
 225 230 235 240
 Ser Leu Ala Leu Ile Trp Asp Asp Leu Arg Ser Leu Cys Leu Phe Ser
 245 250 255
 Tyr His Arg Leu Arg Asp Leu Leu Leu Ile Val Thr Arg Ile Val Glu
 260 265 270
 Leu Leu Gly Arg Arg Gly Trp Glu Ala Leu Lys Tyr Trp Trp Asn Leu
 275 280 285
 Leu Gln Tyr Trp Ser Gln Glu Leu Lys Asn Ser Ala Val Ser Leu Leu
 290 295 300
 Asn Ala Thr Ala Ile Ala Val Ala Glu Gly Thr Asp Arg Val Ile Glu
 305 310 315 320
 Val Val Gln Gly Ala Cys Arg Ala Ile Arg His Ile Pro Arg Arg Ile
 325 330 335
 Arg Gln Gly Leu Glu Arg Ile Leu Leu
 340 345

(2) INFORMATION FOR SEQ ID NO: 50:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 26 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 50:

Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly
 1 5 10 15
 Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 51:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 26 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 51:

Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly
 1 5 10 15
 Ile Trp Gly Cys Ser Gly Lys Ile Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 52:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 52:

Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly
 1 5 10 15
 Ile Trp Gly Cys Ser Gly Lys His Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 53:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 53:

Arg Val Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln Leu Met Gly
 1 5 10 15
 Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 54:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 54:

Arg Val Leu Ala Val Glu Arg Tyr Leu Arg Asp Gln Gln Leu Leu Gly
 1 5 10 15
 Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 55:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 55:

Arg Val Leu Ala Val Glu Arg Tyr Leu Arg Asp Gln Gln Leu Leu Gly
 1 5 10 15
 Ile Trp Gly Cys Ser Gly Arg His Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 56:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 56:

Arg Val Leu Ala Val Glu Arg Tyr Leu Gln Asp Gln Arg Leu Leu Gly
 1 5 10 15
 Met Trp Gly Cys Ser Gly Lys His Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 57:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 57:

Arg Leu Leu Ala Val Glu Arg Tyr Leu Gln Asp Gln Gln Ile Leu Gly
 1 5 10 15
 Leu Trp Gly Cys Ser Gly Lys Ala Val Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 58:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 58:

Arg Leu Leu Ala Leu Glu Thr Phe Ile Gln Asn Gln Gln Leu Leu Asn
 1 5 10 15
 Leu Trp Gly Cys Lys Asn Arg Leu Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 59:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 59:

Arg Leu Gln Ala Leu Glu Thr Leu Ile Gln Asn Gln Gln Arg Leu Asn
 1 5 10 15
 Leu Trp Gly Cys Lys Gly Lys Leu Ile Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 60:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 60:
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Arg Leu Leu Ala Leu Glu Thr Leu Leu Gln Asn Gln Gln Leu Leu Ser
 1 5 10 15
 Leu Trp Gly Cys Lys Gly Lys Leu Val Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 61:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 61:

Arg Val Thr Ala Ile Glu Lys Tyr Leu Gln Asp Gln Ala Arg Leu Asn
 1 5 10 15
 Ser Trp Gly Cys Ala Phe Arg Gln Val Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 62:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 62:

Arg Val Thr Ala Ile Glu Lys Tyr Leu Lys Asp Gln Ala Gln Leu Asn
 1 5 10 15
 Ser Trp Gly Cys Ala Phe Arg Gln Val Cys
 20 25

(2) INFORMATION FOR SEQ ID NO: 63:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 2621 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 63:

AGTGGGATCA ACAGATAAAC AACGTAAGCT CCTTCATATA TGAAAAAATA CAAGAGGCAC	1980
AAGAACAACA GGAGAAAAAT GAGAAAGAAT TGCTGGAGTT AGATGAATGG GCCTCTATTT	2040
GGAATTGGCT TGACATAACT AAATGGTTGT GGTATATAAA AATAGCTATA ATCATAGTAG	2100
GAGCACTAAT AGGTGTAAGA GTAGTTATGA TAGTACTTAA TCTAGTAAAG AACATTAGGC	2160
AGGGATATCA ACCCCTCTCG TTACAGATCC CCATCCAACA ACAAGCGGAA GTAGGAACGC	2220
CAGGAGGAAC AGGAGAAGGA GGTGGAGACG AAGACAGGCG CAGGTGGACT CCATTGCCGC	2280
AAGGGTTCTT GCATCTGTTG TACACGGACC TCAGGACAAT AATCTTGTGG ATTTACCACC	2340
TCTTGAGCAA CTTAGCCTCA GAGATCCAGA AGTTGATCAG ACACCTGGGA CTTGGACTAT	2400
GGATCATAGG GCAGAGGACA ATTGAAGCTT GCAGACTCTT TAAAGCTATA ATACAATACT	2460
GGCTACAAGA ATTGCAAAC AGTGCTACAA ATCTACTAGA TACTGTTGCA GTGGCAGTTG	2520
CTAATTGGAC TGACAGCACA ATCTTAGGCA TACAAAGCAT AGGGAGAGGG ATTCTTAACA	2580
TACCAAGAAG GATTAGACAG GGCCTTGAAC GACTCCTGTT A	2621

(2) INFORMATION FOR SEQ ID NO: 64:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 453 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 64:

GCAGAGACAG GACAGGAAAC TGCCTACTTC CTGTTAAAT TAGCAGCAAG ATGGCCTATT	60
AAAATACTAC ATACAGACAA TGGGCCTAAC TTTACAAGTG CAGCCATGAA AGCTGCATGT	120
TGGTGGACAA ACATACAACA TGAGTTTGGA ATACCATACA ATCCACAAAG TCAAGGAGTA	180
GTAGAAGCCA TGAACAAGGA ATTAAAATCA ATCATACAGG TGAGGGACCA AGCAGAGCAC	240
TTAAGGACAG CAGTACAAAT GGCAGTATTT GTTCACAATT TTAAAAGAAA AGGGGGGATT	300
GGGGGGTACA CTGCAGGAGA GAGATTAATA GACATATTAG CATCACAAAT ACAAACAACA	360
GAACTACAAA AACAAATTTT AAAAATTCAA AATTTTCGGG TCTATTACAG AGACAGCAGA	420
GACCCTATTT GGAAAGGACC GGCACAGCTC CTG	453

(2) INFORMATION FOR SEQ ID NO: 65:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 170 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 65:

Gln Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala
1 5 10 15
Trp Val Lys Ala Val Glu Glu Lys Ala Phe Asn Pro Glu Ile Ile Pro
20 25 30
Met Phe Met Ala Leu Ser Glu Gly Ala Val Pro Tyr Asp Ile Asn Val
35 40 45
Met Leu Asn Ala Ile Gly Gly His Gln Gly Ala Leu Gln Val Leu Lys
50 55 60
Glu Val Ile Asn Asp Glu Ala Ala Asp Trp Asp Arg Ala His Pro Gln
65 70 75 80
Gln Ala Gly Pro Leu Pro Pro Gly Gln Ile Arg Glu Pro Thr Gly Ser
85 90 95
Asp Ile Ala Gly Thr Thr Ser Thr Gln Gln Glu Gln Ile Leu Trp Thr
100 105 110
Thr Arg Ala Gly Asn Pro Ile Pro Val Gly Asp Ile Tyr Arg Lys Trp
115 120 125
Ile Val Leu Gly Leu Asn Lys Met Val Lys Met Tyr Ser Pro Val Ser
130 135 140
Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val
145 150 155 160
Asp Arg Phe Tyr Lys Thr Lys Leu Ala Glu
165 170

(2) INFORMATION FOR SEQ ID NO: 66:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 170 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 66:

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
1 5 10 15
Trp Val Lys Ala Val Glu Glu Lys Ala Phe Asn Pro Glu Ile Ile Pro
20 25 30
Met Phe Met Ala Leu Ser Glu Gly Ala Ile Ser Tyr Asp Ile Asn Thr
35 40 45

Met Leu Asn Ala Ile Gly Gly His Gln Gly Ala Leu Gln Val Leu Lys
 50 55 60
 Glu Val Ile Asn Glu Glu Ala Val Glu Trp Asp Arg Thr His Pro Pro
 65 70 75 80
 Pro Val Gly Pro Leu Pro Pro Gly Gln Ile Arg Glu Pro Thr Gly Ser
 85 90 95
 Asp Ile Ala Gly Thr Thr Ser Thr Gln Gln Glu Gln Ile His Trp Thr
 100 105 110
 Thr Arg Pro Asn Gln Pro Ile Pro Val Gly Asp Ile Tyr Arg Lys Trp
 115 120 125
 Ile Val Leu Gly Leu Asn Lys Met Val Lys Met Tyr Ser Pro Val Ser
 130 135 140
 Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val
 145 150 155 160
 Asp Arg Phe Tyr Lys Thr Lys Leu Ala Glu
 165 170

(2) INFORMATION FOR SEQ ID NO: 67:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 170 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 67:

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
 1 5 10 15
 Trp Val Lys Ala Val Glu Glu Lys Ala Phe Asn Pro Glu Ile Ile Pro
 20 25 30
 Met Phe Met Ala Leu Ser Glu Gly Ala Val Pro Tyr Asp Ile Asn Thr
 35 40 45
 Met Leu Asn Ala Ile Gly Gly His Gln Gly Ala Leu Gln Val Leu Lys
 50 55 60
 Glu Val Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Thr His Pro Pro
 65 70 75 80
 Ala Met Gly Pro Leu Pro Pro Gly Gln Ile Arg Glu Pro Thr Gly Ser
 85 90 95
 Asp Ile Ala Gly Thr Thr Ser Thr Gln Gln Glu Gln Ile Ile Trp Thr
 100 105 110
 Thr Arg Gly Ala Asn Ser Ile Pro Val Gly Asp Ile Tyr Arg Lys Trp
 115 120 125
 Ile Val Leu Gly Leu Asn Lys Met Val Lys Met Tyr Ser Pro Val Ser
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130 135 140
 Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val
 145 150 155 160
 Asp Arg Phe Tyr Lys Thr Lys Leu Ala Glu
 165 170

(2) INFORMATION FOR SEQ ID NO: 68:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 169 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 68:

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
 1 5 10 15
 Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
 20 25 30
 Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
 35 40 45
 Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
 50 55 60
 Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val
 65 70 75 80
 His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser
 85 90 95
 Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met
 100 105 110
 Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile
 115 120 125
 Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile
 130 135 140
 Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
 145 150 155 160
 Arg Phe Tyr Lys Thr Lys Leu Ala Glu
 165

(2) INFORMATION FOR SEQ ID NO: 69:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 169 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 69:

Gln Gly Gln Met Ile His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
1 5 10 15
Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
20 25 30
Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Met
35 40 45
Met Leu Asn Ile Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
50 55 60
Asp Thr Ile Asn Glu Glu Ala Ala Asp Trp Asp Arg Val His Pro Val
65 70 75 80
His Ala Gly Pro Ile Pro Pro Gly Gln Met Arg Glu Pro Arg Gly Ser
85 90 95
Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met
100 105 110
Thr Ser Asn Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile
115 120 125
Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile
130 135 140
Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
145 150 155 160
Arg Phe Phe Lys Thr Lys Leu Ala Glu
165

(2) INFORMATION FOR SEQ ID NO: 70:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 169 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 70:

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
1 5 10 15
Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
20 25 30
Met Phe Ser Ala Leu Ser Glu Gly Ala Leu Pro Gln Asp Val Asn Thr
35 40 45

Met Leu Asn Ala Val Gly Gly His Gln Gly Ala Met Gln Val Leu Lys
 50 55 60
 Glu Val Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Thr
 65 70 75 80
 His Ala Gly Pro Ile Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser
 85 90 95
 Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Thr
 100 105 110
 Thr Ala Asn Pro Pro Ile Pro Val Gly Asp Val Tyr Arg Arg Trp Val
 115 120 125
 Ile Leu Gly Leu Asn Lys Val Val Arg Met Tyr Cys Pro Val Ser Ile
 130 135 140
 Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
 145 150 155 160
 Arg Phe Tyr Lys Thr Lys Leu Ala Glu
 165

(2) INFORMATION FOR SEQ ID NO: 71:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 35 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 71:

Cys Thr Arg Pro Tyr Lys Asn Thr Arg Gln Arg Thr Gly Ile Gly Pro
 1 5 10 15
 Gly Gln Ala Leu Tyr Thr Thr His Arg Ile Ile Gly Asp Ile Arg Gln
 20 25 30
 Ala His Cys
 35

(2) INFORMATION FOR SEQ ID NO: 72:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 37 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 72:

Arg Val Leu Ala Val Glu Arg Tyr Leu Gln Asp Gln Gln Leu Leu Gly
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1 5 10 15
 Ile Trp Gly Cys Ser Gly Lys His Ile Cys Thr Thr Thr Val Pro Trp
 20 25 30
 Asn Ser Ser Trp Ser
 35

(2) INFORMATION FOR SEQ ID NO: 73:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 36 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 73:

Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys Ser Ile Arg Ile Gln Arg
 1 5 10 15
 Gly Pro Gly Arg Ala Phe Val Thr Ile Gly Lys Ile Gly Asn Met Arg
 20 25 30
 Gln Ala His Cys
 35

(2) INFORMATION FOR SEQ ID NO: 74:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 37 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 74:

Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly
 1 5 10 15
 Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys Thr Thr Ala Val Pro Trp
 20 25 30
 Asn Ala Ser Trp Ser
 35

(2) INFORMATION FOR SEQ ID NO: 75:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 37 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 75:

Cys Thr Arg Pro Asn Asn Asn Thr Arg Asn Arg Ile Ser Ile Gln Arg
1 5 10 15
Gly Pro Gly Arg Ala His Val Thr Thr Lys Gln Ile Ile Gly Asp Ile
20 25 30
Arg Gln Ala His Cys
35

(2) INFORMATION FOR SEQ ID NO: 76:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 76:

Arg Val Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly
1 5 10 15
Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys Thr Thr Thr Val Pro Trp
20 25 30
Asn Ala Ser Trp Ser
35

(2) INFORMATION FOR SEQ ID NO: 77:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 34 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 77:

Cys Ala Arg Pro Tyr Gln Asn Thr Arg Gln Arg Thr Pro Ile Gly Leu
1 5 10 15
Gly Gln Ser Leu Tyr Thr Thr Arg Ser Arg Ser Ile Ile Gly Gln Ala
20 25 30
His Cys

(2) INFORMATION FOR SEQ ID NO: 78:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 78:

Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly
1 5 10 15
Ile Trp Gly Cys Ser Gly Lys His Ile Cys Thr Thr Asn Val Pro Trp
20 25 30
Asn Ser Ser Trp Ser
35

(2) INFORMATION FOR SEQ ID NO: 79:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 33 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 79:

Cys Thr Arg Pro Gly Asn Asn Thr Arg Arg Gly Ile His Phe Gly Pro
1 5 10 15
Gly Gln Ala Leu Tyr Thr Thr Gly Val Gly Asp Ile Arg Arg Ala Tyr
20 25 30
Cys

(2) INFORMATION FOR SEQ ID NO: 80:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 80:

Arg Val Leu Ala Val Glu Arg Tyr Leu Gln Asp Gln Arg Leu Leu Gly
1 5 10 15

Met Trp Gly Cys Ser Gly Lys His Ile Cys Thr Thr Phe Val Pro Trp
 20 25 30
 Asn Ser Ser Trp Ser
 35

(2) INFORMATION FOR SEQ ID NO: 81:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 36 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 81:

Cys Ser Arg Pro Tyr Asn Thr Arg Lys Asn Ile Arg Arg Tyr Ser Ile
 1 5 10 15
 Gly Ser Gly Gln Ala Phe Tyr Val Thr Gly Lys Ile Gly Asp Ile Arg
 20 25 30
 Gln Ala His Cys
 35

(2) INFORMATION FOR SEQ ID NO: 82:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 37 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 82:

Arg Val Leu Ala Val Glu Arg Tyr Leu Gln Asp Gln Gln Leu Leu Gly
 1 5 10 15
 Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys Thr Thr Thr Val Pro Trp
 20 25 30
 Asn Ser Ser Trp Ser
 35

(2) INFORMATION FOR SEQ ID NO: 83:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 35 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 83:

Cys His Arg Pro Gly Asn Asn Thr Arg Gly Glu Val Gln Ile Gly Pro
1 5 10 15
Gly Met Thr Phe Tyr Asn Ile Glu Asn Val Val Gly Asp Thr Arg Ser
20 25 30
Ala Tyr Cys
35

(2) INFORMATION FOR SEQ ID NO: 84:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 84:

Arg Leu Leu Ala Val Glu Arg Tyr Leu Gln Asp Gln Gln Ile Leu Gly
1 5 10 15
Leu Trp Gly Cys Ser Gly Lys Ala Val Cys Tyr Thr Thr Val Pro Trp
20 25 30
Asn Asn Ser Trp Pro
35

(2) INFORMATION FOR SEQ ID NO: 85:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 85:

Cys Glu Arg Pro Gln Ile Asp Ile Gln Glu Met Arg Ile Gly Pro Met
1 5 10 15
Ala Trp Tyr Ser Met Gly Ile Gly Gly Thr Ala Gly Asn Ser Ser Arg
20 25 30
Gln Ala Tyr Cys
35

(2) INFORMATION FOR SEQ ID NO: 86:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 86:

Arg Leu Leu Ala Leu Glu Thr Leu Leu Gln Asn Gln Gln Leu Leu Ser
1 5 10 15
Leu Trp Gly Cys Lys Gly Lys Leu Val Cys Tyr Thr Ser Val Lys Trp
20 25 30
Asn Arg Thr Trp Ile
35

(2) INFORMATION FOR SEQ ID NO: 87:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 87:

Cys Ile Arg Glu Gly Ile Ala Glu Val Gln Asp Ile Tyr Thr Gly Pro
1 5 10 15
Met Arg Trp Arg Ser Met Thr Leu Ile Arg Ser Asn Asn Thr Ser Arg
20 25 30
Val Ala Tyr Cys
35

(2) INFORMATION FOR SEQ ID NO: 88:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 88:

Arg Leu Gln Ala Leu Glu Thr Leu Ile Gln Asn Gln Gln Arg Leu Asn
1 5 10 15

Leu Trp Gly Cys Lys Gly Lys Leu Ile Cys Tyr Thr Ser Val Lys Trp
 20 25 30
 Asn Arg Thr Trp Ile
 35

(2) INFORMATION FOR SEQ ID NO: 89:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 37 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 89:

Cys Glu Arg Pro Gly Asn Gln Thr Ile Gln Lys Ile Met Ala Gly Pro
 1 5 10 15
 Met Ala Trp Tyr Ser Met Ala Leu Ser Asn Thr Lys Gly Asp Thr Ser
 20 25 30
 Arg Ala Ala Tyr Cys
 35

(2) INFORMATION FOR SEQ ID NO: 90:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 37 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 90:

Arg Leu Leu Ala Leu Glu Thr Phe Ile Gln Asn Gln Gln Leu Leu Asn
 1 5 10 15
 Leu Trp Gly Cys Lys Asn Arg Leu Ile Cys Tyr Thr Ser Val Lys Trp
 20 25 30
 Asn Lys Thr Trp Gly
 35

(2) INFORMATION FOR SEQ ID NO: 91:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 40 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 91:

Cys Xaa Arg Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ile Xaa Xaa Xaa Xaa
1 5 10 15
Gly Pro Met Xaa Trp Xaa Ser Met Xaa Xaa Xaa Xaa Xaa Xaa Xaa
20 25 30
Xaa Xaa Ser Arg Xaa Ala Xaa Cys
35 40

(2) INFORMATION FOR SEQ ID NO: 92:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 92:

Arg Leu Xaa Ala Leu Glu Thr Xaa Xaa Gln Asn Gln Gln Xaa Leu Xaa
1 5 10 15
Leu Trp Gly Cys Xaa Xaa Xaa Xaa Xaa Cys Tyr Thr Ser Val Xaa Trp
20 25 30
Asn Xaa Thr Trp Xaa
35

(2) INFORMATION FOR SEQ ID NO: 93:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 93:

Cys Val Arg Pro Gly Asn Asn Ser Val Lys Glu Ile Lys Ile Gly Pro
1 5 10 15
Met Ala Trp Tyr Ser Met Gln Ile Glu Arg Glu Gly Lys Gly Ala Asn
20 25 30
Ser Arg Thr Ala Phe Cys
35

(2) INFORMATION FOR SEQ ID NO: 94:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 94:

Arg Leu Leu Ala Leu Glu Thr Leu Met Gln Asn Gln Gln Leu Leu Asn
1 5 10 15
Leu Trp Gly Cys Arg Gly Lys Ala Ile Cys Tyr Thr Ser Val Gln Trp
20 25 30
Asn Glu Thr Trp Gly
35

(2) INFORMATION FOR SEQ ID NO: 95:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 513 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 95:

CAGGGACAAA TGGTACATCA GGCCATCTCC CCCAGAACTT TATATGTATG GGTAAGGCA 60
GTAGAAGAAA AGGCCTTTAA CCCTGAAATT ATCCCTATGT TTATGGCACT ATCAGAAGGA 120
GCTGTTCCCT ATGATATCAA TGTTATGCTA AATGCCATAG GAGGACACCA AGGGGCTTTA 180
CAAGTATTAA AAGAAGTAAT CAATGATGAA GCAGCAGACT GGGATAGAGC TCACCCACAA 240
CAGGCAGGGC CGTTACCACC AGGGCAGATA AGGGAACCAA CAGGAAGTGA CATTGCTGGA 300
ACAACTAGCA CACAGCAAGA GCAAATTCTC TGGACTACTA GGGCAGGTAA CCCTATCCCA 360
GTTGGAGACA TCTATAGGAA ATGGATAGTG TTGGGTCTAA ACAAATGGT AAAAAATGTAT 420
AGTCCAGTGA GCATCTTAGA TATTAGGCAG GGACCAAAAG AACCATTTAG AGATTATGTA 480
GACAGGTTCT ACAAACATT AAGAGCTGAG CAG 513

(2) INFORMATION FOR SEQ ID NO: 96:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 171 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 96:

Gln Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala
1 5 10 15
Trp Val Lys Ala Val Glu Glu Lys Ala Phe Asn Pro Glu Ile Ile Pro
20 25 30
Met Phe Met Ala Leu Ser Glu Gly Ala Val Pro Tyr Asp Ile Asn Val
35 40 45
Met Leu Asn Ala Ile Gly Gly His Gln Gly Ala Leu Gln Val Leu Lys
50 55 60
Glu Val Ile Asn Asp Glu Ala Ala Asp Trp Asp Arg Ala His Pro Gln
65 70 75 80
Gln Ala Gly Pro Leu Pro Pro Gly Gln Ile Arg Glu Pro Thr Gly Ser
85 90 95
Asp Ile Ala Gly Thr Thr Ser Thr Gln Gln Glu Gln Ile Leu Trp Thr
100 105 110
Thr Arg Ala Gly Asn Pro Ile Pro Val Gly Asp Ile Tyr Arg Lys Trp
115 120 125
Ile Val Leu Gly Leu Asn Lys Met Val Lys Met Tyr Ser Pro Val Ser
130 135 140
Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val
145 150 155 160
Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln
165 170

(2) INFORMATION FOR SEQ ID NO: 97:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 525 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 97:

ATTCCAATAC ACTATTGTGC TCCAGCAGGA TATGCTATCT TTAAATGCAA CAACGAGGAG	60
TTTACTGGAA AAGGCCCATG TAACAACATT TCAGTAGTTA CCTGTACACA GGGTATCAAG	120
CCAACAGTAA GCACTCATCT AATATTCAAT GGGACAATCT CTGAAAGAAA AATAAGAATT	180
ATGGGAAAGA ACATCTCGAG CAACTCAGGT AATATCCTAG TGACCCTAAA TTCTACTATA	240
AACATGACCT GTGTGAGGCC AGGAAATAAT TCAGTACAGG AGATAAAAAT AGGTCCAATG	300

GCTTGGTACA GTATGCAAT TGAGCGAGAG GGAAAAGGAG CAAATTCAAG AACAGCTTTT 360
 TGTACCTATA ATGCCACGGA CTGGAGAAAA ACCTTGCAAG GGATAGCTGA AAGGTATTTA 420
 GAACTTGTA ATAAAACAAG TCCGACTGAA ATAATGTTCA ATAAAAGCAA TGGTGGAGAT 480
 GCAGAAATAA CCCGTTTGCA TTTTAACTGT CATGGAGAAT TCTTT 525

(2) INFORMATION FOR SEQ ID NO: 98:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 175 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 98:

Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Tyr Ala Ile Phe Lys Cys
 1 5 10 15
 Asn Asn Glu Glu Phe Thr Gly Lys Gly Pro Cys Asn Asn Ile Ser Val
 20 25 30
 Val Thr Cys Thr Gln Gly Ile Lys Pro Thr Val Ser Thr His Leu Ile
 35 40 45
 Phe Asn Gly Thr Ile Ser Glu Arg Lys Ile Arg Ile Met Gly Lys Asn
 50 55 60
 Ile Ser Ser Asn Ser Gly Asn Ile Leu Val Thr Leu Asn Ser Thr Ile
 65 70 75 80
 Asn Met Thr Cys Val Arg Pro Gly Asn Asn Ser Val Gln Glu Ile Lys
 85 90 95
 Ile Gly Pro Met Ala Trp Tyr Ser Met Gln Ile Glu Arg Glu Gly Lys
 100 105 110
 Gly Ala Asn Ser Arg Thr Ala Phe Cys Thr Tyr Asn Ala Thr Asp Trp
 115 120 125
 Arg Lys Thr Leu Gln Gly Ile Ala Glu Arg Tyr Leu Glu Leu Val Asn
 130 135 140
 Lys Thr Ser Pro Thr Glu Ile Met Phe Asn Lys Ser Asn Gly Gly Asp
 145 150 155 160
 Ala Glu Ile Thr Arg Leu His Phe Asn Ser Cys Gly Glu Phe Phe
 165 170 175

(2) INFORMATION FOR SEQ ID NO: 99:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 312 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 99:

```
ATAGTGCAAC AGCAGGACAA CCTGCTGAGA GCAATACAGG CCCAGCAACA TCTGCTGAGG      60
TTATCTGTAT GGGGTATTAG ACAACTCCGA GCTCGCCTGC TAGCCTTAGA AACCCCTTATG    120
CAGAATCAGC AACTCCTAAA CCTGTGGGGT TGTAGAGGAA AAGCAATCTG CTACACATCA      180
GTACAATGGA ATGAAACATG GGGAGGAAAT GACTCAATTT GGGACAGGTT AACATGGCAG      240
CAATGGGATC AACAGATAGC CAATGTAAGC TCTTTTATAT ATGACAAAAT ACAAGAAGCA      300
CAAGAACAAC AA                                                              312
```

(2) INFORMATION FOR SEQ ID NO: 100:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 104 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 100:

```
Ile Val Gln Gln Gln Asp Asn Leu Leu Arg Ala Ile Gln Ala Gln Gln
1          5          10          15
His Leu Leu Arg Leu Ser Val Trp Gly Ile Arg Gln Leu Arg Ala Arg
20        25        30
Leu Leu Ala Leu Glu Thr Leu Met Gln Asn Gln Gln Leu Leu Asn Leu
35        40        45
Trp Gly Cys Arg Gly Lys Ala Ile Cys Tyr Thr Ser Val Gln Trp Asn
50        55        60
Glu Thr Trp Gly Gly Asn Asp Ser Ile Trp Asp Arg Leu Thr Trp Gln
65        70        75        80
Gln Trp Asp Gln Gln Ile Ala Asn Val Ser Ser Phe Ile Tyr Asp Lys
85        90        95
Ile Gln Glu Ala Gln Glu Gln Gln
100
```

(2) INFORMATION FOR SEQ ID NO: 101:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 35 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 101:

Arg Leu Leu Ala Leu Glu Thr Phe Ile Gln Asn Gln Gln Leu Leu Asn
1 5 10 15
Leu Trp Gly Cys Lys Asn Arg Leu Ile Cys Tyr Thr Ser Val Lys Trp
20 25 30
Asn Lys Thr
35

(2) INFORMATION FOR SEQ ID NO: 102:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 877 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 102:

Met Thr Ala Ile Met Lys Ala Met Gly Lys Arg Asn Arg Lys Leu Gly
1 5 10 15
Ile Trp Cys Leu Ile Leu Ala Leu Ile Ile Pro Cys Leu Ser Cys Asn
20 25 30
Gln Leu Tyr Ala Thr Val Tyr Ser Gly Val Pro Val Trp Glu Asp Ala
35 40 45
Lys Pro Thr Leu Phe Cys Ala Ser Asp Ala Asn Leu Thr Ser Thr Glu
50 55 60
Gln His Asn Ile Trp Ala Thr Gln Ala Cys Val Pro Thr Asp Pro Ser
65 70 75 80
Pro Asn Glu Tyr Glu Leu Lys Asn Val Thr Gly Lys Phe Asn Ile Trp
85 90 95
Lys Asn Tyr Ile Val Asp Gln Met His Glu Asp Ile Ile Asp Leu Trp
100 105 110
Asp Gln Ser Leu Lys Pro Cys Val Gln Met Thr Phe Leu Cys Val Gln
115 120 125
Met Asn Cys Thr Asp Ile Lys Asn Ser Ile Asn Thr Thr Asn Ser Pro
130 135 140
Leu Asn Ser Asn Asn Thr Lys Glu Val Lys Gln Cys Asp Phe Asn Val
145 150 155 160
Thr Thr Val Leu Lys Asp Lys Gln Glu Lys Lys Gln Ala Leu Phe Tyr
165 170 175

Val Thr Asp Leu Val Lys Ile Asn Ala Thr Ser Asn Glu Thr Met Tyr
 180 185 190
 Arg Leu Ile Asn Cys Asn Ser Thr Thr Ile Arg Gln Ala Cys Pro Lys
 195 200 205
 Val Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Cys
 210 215 220
 Ala Ile Phe Lys Cys Asn Glu Thr Gly Phe Asn Gly Thr Gly Leu Cys
 225 230 235 240
 Lys Asn Val Thr Val Val Thr Cys Thr His Gly Ile Lys Pro Thr Val
 245 250 255
 Ser Thr Gln Leu Ile Leu Asn Gly Thr Leu Ser Lys Gly Asn Ile Thr
 260 265 270
 Ile Met Gly Lys Asn Ile Ser Asp Ser Gly Glu Asn Ile Leu Ile Thr
 275 280 285
 Leu Asn Thr Asn Ile Thr Ile Ala Cys Glu Arg Pro Gly Asn Gln Thr
 290 295 300
 Ile Gln Lys Ile Met Ala Gly Pro Met Ala Trp Tyr Ser Met Ala Leu
 305 310 315 320
 Ser Asn Thr Lys Gly Asp Thr Arg Ala Ala Tyr Cys Asn Tyr Ser Ala
 325 330 335
 Thr Asp Trp Asn Lys Ala Leu Lys Asn Ile Thr Glu Arg Tyr Leu Glu
 340 345 350
 Leu Val Glu Tyr Asn Gln Thr Asp Val Thr Met Lys Phe Gly Asn His
 355 360 365
 Ser Gly Glu Asp Ala Glu Val Thr Asn Phe Phe Phe Asn Cys His Gly
 370 375 380
 Glu Phe Phe Tyr Cys Asn Thr Asn Arg Leu Phe Asn His Thr Phe Ser
 385 390 395 400
 Cys Lys Lys Asn Met Thr Asn Asn Lys Ile Asn Cys Thr Asn Ile Ser
 405 410 415
 Asn Asn Ser Asn Gly Thr Gln Ala Ile Pro Cys Arg Leu Arg Gln Val
 420 425 430
 Val Arg Asp Trp Met Arg Gly Gly Ser Gly Leu Tyr Ala Pro Pro Ile
 435 440 445
 Pro Gly Asn Leu Val Cys Arg Ser Asn Ile Thr Gly Met Ile Leu Gln
 450 455 460
 Leu Asp Thr Pro Trp Asn Lys Thr His Pro Asn Ser Thr Thr Leu Arg
 465 470 475 480
 Pro Gly Gly Gly Asp Met Lys Asp Ile Trp Arg Thr Gln Leu Phe Lys
 485 490 495
 Tyr Lys Val Val Arg Val Lys Pro Phe Ser Val Ala Pro Thr Lys Ile
 500 505 510

Ala Arg Pro Thr Ile Gly Thr Arg Ser His Arg Glu Lys Arg Ala Ala
 515 520 525
 Gly Leu Ala Met Leu Phe Leu Gly Ile Leu Ser Ala Ala Gly Ser Thr
 530 535 540
 Met Gly Ala Ala Ala Thr Ala Leu Thr Val Arg Thr Gln His Leu Ile
 545 550 555 560
 Lys Gly Ile Val Gln Gln Gln Asp Asn Leu Arg Ala Ile Gln Ala
 565 570 575
 Gln Gln His Leu Leu Arg Pro Ser Val Trp Gly Ile Arg Gln Leu Arg
 580 585 590
 Ala Arg Leu Leu Ala Leu Glu Thr Phe Ile Gln Asn Gln Gln Leu Leu
 595 600 605
 Asn Leu Trp Gly Cys Lys Asn Arg Leu Ile Cys Tyr Thr Ser Val Lys
 610 615 620
 Trp Asn Lys Thr Trp Gly Gly Asp Asn Glu Ser Ile Trp Asp Glu Leu
 625 630 635 640
 Thr Trp Gln Gln Trp Asp Gln Gln Ile Asn Asn Val Ser Ser Phe Ile
 645 650 655
 Tyr Glu Lys Ile Gln Glu Ala Gln Glu Gln Gln Glu Lys Asn Glu Lys
 660 665 670
 Glu Leu Leu Glu Leu Asp Glu Trp Ala Ser Ile Trp Asn Trp Leu Asp
 675 680 685
 Ile Thr Lys Trp Leu Trp Tyr Ile Lys Ile Ala Ile Ile Ile Val Gly
 690 695 700
 Ala Leu Ile Gly Val Arg Val Val Met Ile Val Leu Asn Leu Val Lys
 705 710 715 720
 Asn Ile Arg Gln Gly Tyr Gln Pro Leu Ser Leu Gln Ile Pro Ile Gln
 725 730 735
 Gln Gln Ala Glu Val Gly Thr Pro Gly Gly Thr Gly Glu Gly Gly Gly
 740 745 750
 Asp Glu Asp Arg Arg Arg Trp Thr Pro Leu Pro Gln Gly Phe Leu His
 755 760 765
 Leu Leu Tyr Thr Asp Leu Arg Thr Ile Ile Leu Trp Ile Tyr His Leu
 770 775 780
 Leu Ser Asn Leu Ala Ser Glu Ile Gln Lys Leu Ile Arg His Leu Gly
 785 790 795 800
 Leu Gly Leu Trp Ile Ile Gly Gln Arg Thr Ile Glu Ala Cys Arg Leu
 805 810 815
 Phe Lys Ala Ile Ile Gln Tyr Trp Leu Gln Glu Leu Gln Thr Ser Ala
 820 825 830
 Thr Asn Leu Leu Asp Thr Val Ala Val Ala Val Ala Asn Trp Thr Asp
 835 840 845
 Ser Thr Ile Leu Gly Ile Gln Ser Ile Gly Arg Gly Ile Leu Asn Ile
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850	855	860
Pro Arg Arg Ile Arg Gln Gly Leu Glu Arg Leu Leu Leu		
865	870	875

(2) INFORMATION FOR SEQ ID NO: 103:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 861 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 103:

Met	Arg	Val	Lys	Glu	Lys	Tyr	Gln	His	Leu	Trp	Arg	Trp	Gly	Trp	Lys
1			5						10					15	
Trp	Gly	Thr	Met	Leu	Leu	Gly	Ile	Leu	Met	Ile	Cys	Ser	Ala	Thr	Glu
			20					25					30		
Lys	Leu	Trp	Val	Thr	Val	Tyr	Tyr	Gly	Val	Pro	Val	Trp	Lys	Glu	Ala
			35				40					45			
Thr	Thr	Thr	Leu	Phe	Cys	Ala	Ser	Asp	Ala	Lys	Ala	Tyr	Asp	Thr	Glu
			50			55					60				
Val	His	Asn	Val	Trp	Ala	Thr	His	Ala	Cys	Val	Pro	Thr	Asp	Pro	Asn
65					70				75					80	
Pro	Gln	Glu	Val	Val	Leu	Val	Asn	Val	Thr	Glu	Asn	Phe	Asn	Met	Trp
				85					90					95	
Lys	Asn	Asp	Met	Val	Glu	Gln	Met	His	Glu	Asp	Ile	Ile	Ser	Leu	Trp
			100					105					110		
Asp	Gln	Ser	Leu	Lys	Pro	Cys	Val	Lys	Leu	Thr	Pro	Leu	Cys	Val	Ser
			115				120					125			
Leu	Lys	Cys	Thr	Asp	Leu	Gly	Asn	Ala	Thr	Asn	Thr	Asn	Ser	Ser	Asn
			130			135					140				
Thr	Asn	Ser	Ser	Ser	Gly	Glu	Met	Met	Met	Glu	Lys	Gly	Glu	Ile	Lys
145					150					155				160	
Asn	Cys	Ser	Phe	Asn	Ile	Ser	Thr	Ser	Ile	Arg	Gly	Lys	Val	Gln	Lys
				165					170					175	
Glu	Tyr	Ala	Phe	Phe	Tyr	Lys	Leu	Asp	Ile	Ile	Pro	Ile	Asp	Asn	Asp
			180					185					190		
Thr	Thr	Ser	Tyr	Thr	Leu	Thr	Ser	Cys	Asn	Thr	Ser	Val	Ile	Thr	Gln
			195				200					205			
Ala	Cys	Pro	Lys	Val	Ser	Phe	Glu	Pro	Ile	Pro	Ile	His	Tyr	Cys	Ala
			210			215					220				

Pro Ala Gly Phe Ala Ile Leu Lys Cys Asn Asn Lys Thr Phe Asn Gly
 225 230 235 240
 Thr Gly Pro Cys Thr Asn Val Ser Thr Val Gln Cys Thr His Gly Ile
 245 250 255
 Arg Pro Val Val Ser Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu
 260 265 270
 Glu Glu Val Val Ile Arg Ser Ala Asn Phe Thr Asp Asn Ala Lys Thr
 275 280 285
 Ile Ile Val Gln Leu Asn Gln Ser Val Glu Ile Asn Cys Thr Arg Pro
 290 295 300
 Asn Asn Asn Thr Arg Lys Ser Ile Arg Ile Gln Arg Gly Pro Gly Arg
 305 310 315 320
 Ala Phe Val Thr Ile Gly Lys Ile Gly Asn Met Arg Gln Ala His Cys
 325 330 335
 Asn Ile Ser Arg Ala Lys Trp Asn Ala Thr Leu Lys Gln Ile Ala Ser
 340 345 350
 Lys Leu Arg Glu Gln Phe Gly Asn Asn Lys Thr Ile Ile Phe Lys Gln
 355 360 365
 Ser Ser Gly Gly Asp Pro Glu Ile Val Thr His Ser Phe Asn Cys Gly
 370 375 380
 Gly Glu Phe Phe Tyr Cys Asn Ser Thr Gln Leu Phe Asn Ser Thr Trp
 385 390 395 400
 Phe Asn Ser Thr Trp Ser Thr Glu Gly Ser Asn Asn Thr Glu Gly Ser
 405 410 415
 Asp Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln Phe Ile Asn Met Trp
 420 425 430
 Gln Glu Val Gly Lys Ala Met Tyr Ala Pro Pro Ile Ser Gly Gln Ile
 435 440 445
 Arg Cys Ser Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg Asp Gly Gly
 450 455 460
 Asn Asn Asn Asn Gly Ser Glu Ile Phe Arg Pro Gly Gly Gly Asp Met
 465 470 475 480
 Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys Val Val Lys Ile
 485 490 495
 Glu Pro Leu Gly Val Ala Pro Thr Lys Ala Lys Arg Arg Val Val Gln
 500 505 510
 Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Leu Phe Leu Gly Phe Leu
 515 520 525
 Gly Ala Ala Gly Ser Thr Met Gly Ala Arg Ser Met Thr Leu Thr Val
 530 535 540
 Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
 545 550 555 560

Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp
 565 570 575
 Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
 580 585 590
 Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser Gly Lys Leu Ile
 595 600 605
 Cys Thr Thr Ala Val Pro Trp Asn Ala Ser Trp Ser Asn Lys Ser Leu
 610 615 620
 Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile
 625 630 635 640
 Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn
 645 650 655
 Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala
 660 665 670
 Ser Leu Trp Asn Trp Phe Asn Ile Thr Asn Trp Leu Trp Tyr Ile Lys
 675 680 685
 Ile Phe Ile Met Ile Val Gly Gly Leu Val Gly Leu Arg Ile Val Phe
 690 695 700
 Ala Val Leu Ser Ile Val Asn Arg Val Arg Gln Gly Tyr Ser Pro Leu
 705 710 715 720
 Ser Phe Gln Thr His Leu Pro Thr Pro Arg Gly Pro Asp Arg Pro Glu
 725 730 735
 Gly Ile Glu Glu Glu Gly Gly Glu Arg Asp Arg Asp Arg Ser Ile Arg
 740 745 750
 Leu Val Asn Gly Ser Leu Ala Leu Ile Trp Asp Asp Leu Arg Ser Leu
 755 760 765
 Cys Leu Phe Ser Tyr His Arg Leu Arg Asp Leu Leu Leu Ile Val Thr
 770 775 780
 Arg Ile Val Glu Leu Leu Gly Arg Arg Gly Trp Glu Ala Leu Lys Tyr
 785 790 795 800
 Trp Trp Asn Leu Leu Gln Tyr Trp Ser Gln Glu Leu Lys Asn Ser Ala
 805 810 815
 Val Ser Leu Leu Asn Ala Thr Ala Ile Ala Val Ala Glu Gly Thr Asp
 820 825 830
 Arg Val Ile Glu Val Val Gln Gly Ala Cys Arg Ala Ile Arg His Ile
 835 840 845
 Pro Arg Arg Ile Arg Gln Gly Leu Glu Arg Ile Leu Leu
 850 855 860